Original Article

The Effect of Rhythmic Breathing on the Anxiety of Dressing Change in Burning Patients

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Abstract

Background: Burning is one of the worst accidents that people may now experience in modern society. One of the most critical problems of burn patients is the anxiety caused by medical treatments such as burn dressing. The present study aimed to determine the effect of rhythmic breathing on the anxiety of dressing change in burn patients.

Materials and Methods: This experimental clinical trial was done on 60 burn hospitalized patients in Ayatollah Mousavi educational-therapeutic hospital of Zanjan province in 2017. The sampling was performed continuously and the samples were randomly assigned to control and experimental groups (30 subjects in each group). The data collection tool included a demographic questionnaire and numerical anxiety scale. First, the demographic characteristics questionnaire was completed by the samples. Then, the rhythmic breathing was taught to the experimental group for 20 minutes until complete learning, and they were asked to perform the rhythmic breathing during dressing. Before and after dressing, anxiety was evaluated in the experimental and control groups for 3 consecutive days. After collecting data and entering them into SPSS 20, data were
analyzed using descriptive statistics, chi-square test, independent and dependent t test, and Friedman test.

Results: Based on the findings of the study, both groups were homogeneous in terms of age, gender, education, percentage and the degree of burn, and there was no statistically significant difference. The results of the Friedman test showed that the anxiety severity had a statistically significant difference in both control and experimental groups before and after the intervention ($P<0.001$). However, the severity of anxiety after the intervention further reduced in the experimental group compared to the control group, and this reduction was statistically significant in the experimental group ($P<0.001$).

Conclusion: In general, rhythmic breathing is effective in reducing anxiety caused by a dressing change in burn patients. Thus, this method can be used to decrease the anxiety of dressing.

Keywords: Rhythmic breathing, Anxiety, Dressing, Burn patient

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Introduction

Burning is one of the worst tragic events that people can experience in modern society (1) that can occur in all age groups and social classes (2). Severe burns associated with pain, anxiety, depression, physical and psychological injuries, disability, and death lead to the special health attention to this group (3). Untreated anxiety causes the disturbance in sleeping, relaxation, and patient comfort, as well as non-compliance from the treatment and dissatisfaction of the patient to the medical team. In addition, anxiety can increase pain and lead to disability and prolonged hospitalization and treatment (4).

The World Health Organization has announced that after the injuries caused by the accidents, falls, and violence, injuries caused by burns are the fourth most common injuries in the world and the prevalence of burns in developing countries is 1.3 per 100 000 people. In developed countries, however, it is 14.0 per 100 000 people. It is estimated that 270 000 people die because of burning that most commonly occurs in countries with low or average incomes (4). Based on the most recent studies in Iran, following circulatory diseases,

accidents, poisonings, suicide, and fire have the highest rate of death and injuries from burning is the second most common cause of death after vehicle accidents (5). Burning statistics in Iran, with 75 million people, is 150 thousands every year from which 25 to 30 thousands are hospitalized, indicating that the burning statistics are higher (6). In addition, it is significant that people who suffer from burning, tolerate many problems like physical, psychological, and economical problems. The anxiety caused by painful accidents and care actions, as well as the thought of future with the burnt body and treatment costs are among the most common psychological problems regarding anxiety (7). A common method to control anxiety in people suffering from burning includes anti-anxiety medicines with morphine drugs that are not suitable for patients and are not usually enough based on the side effects of the drugs (8). Anti-anxiety medicines and medicines with morphine probably raise the disorders in sleeping, insufficiency, nausea, anorexia, psychosis, motion disorder, and constipation (9). On the other side, physiological aspects and how to control anxiety by thinking and behavioral practices direct the studies to use non-medicine methods including supplementary medicine, along with medicine in order to reduce anxiety (10).

Non-medicine interventions are hypnotism, art therapy and game therapy, thinking diversion, music therapy, and relaxation methods that are used for treating the burning anxiety (11), among which, relaxation is one of the most important non-medicine methods. Ventral breathing in a calm, regular, and deep manner that is one of the simplest and oldest relaxation techniques that leads to the cognitive diversity and a change in the structure of harmful stimulants such as pain and anxiety in addition to relaxation benefits (12, 13). Further, this relaxation technique is the deep varied breathing from the nose spiracle, along with breathing against spiracle resistance and different physical situations and holding the breath in the lungs. Furthermore, ventral breathing can have pain reduction effects on anxiety, depression, breathing disorders after accidents, chronic pain, and stress from sickness (11). In this case, Park et al believe that nurses can apply breathing exercises that are highly simple and applicable for reducing the pain and anxiety of patients who suffer from burning (14).

Nurses are people from clinical groups who are responsible for different care methods to relieve pain, reduce anxiety, and create relaxation for the patient. One of the relief, relaxation, and executable methods is deep breathing that seems to reduce pain and anxiety (11). Moreover, this method is simple and easy to learn and has no cost and patients can use it independently. Additionally, nurses are the members of the treatment group who are directly responsible for these patients and provide a variety of care methods to relieve pain, reduce anxiety, and create relaxation. Given that limited studies are available in this field, the present study attempted to determine the effect of deep breathing on the anxiety caused by dress changing in people suffering from burning.

Materials and Methods

This clinical experimental study investigated the control group in which the effect of rhythmic breathing and dress change were considered as independent and dependent variables, respectively. To conduct this research, permission was obtained from the Ethics Committee (IR.IUMS.REC 1395.9211196251; identifier: IRCT2016052928153N1, https://www.irct.ir/trial/22899) of Nursing and Obstetrics Faculty of Iran Medical University. Then, the author referred to the Ayatollah Mousavi Educational-Therapeutic Center of Zanjan province and conducted the research after obtaining the permission of the manager and the official of the burning department. The patients were included in the study if they passed four days of hospitalization due to burning crucial period, performed daily dressing, were above 18 years old, had no aspiration, electrical, and self-burning, and had burns between 10% and 40% that were within 1, 2, and 3 burning degrees. In addition, the other inclusion criteria were having the ability to communicate orally and understand Persian language, having reading and writing literacy, doing the breathing, having no addiction to drugs and psychological disorders, and having hearing and sighting abilities.

The patients could discontinue the study if they were unwilling to participate or discharged before the study completion. Sampling was performed progressively during two months and after receiving written permission, people participated in the study and divided into control and test groups based on the random allocation rule. With the cooperation of officials, the room of the patients in the control group was separated from that of the experimental group. Data collecting tools were two questionnaires, including demographic and patient characteristics (the questionnaire includes questions about age, gender, level of education, marital status, job, base illness records, burning degree, the percentage of burning and its deepness, its causes, its location, and consuming relief drugs).

The other questionnaire was a numerical scale of anxiety. This scale was a horizontal line in 10 cm grading from 1 to 10 based on numerical scales. In this scale, 0 indicated the lack of anxiety while 1-4, 5-6, 7-8, and 9-10 scales demonstrated light, medium, severe, and sever anxiety, respectively.

The samples were requested to mark on a point in the line that was in accordance with their anxiety or mention the number orally. Previous studies have widely used this tool in Iran. Content validity was used to determine the validity of the demographic questionnaire. Accordingly, data collecting form was provided after studying the

related references and books and then, the form was corrected by using the opinions related to the board members of the nursing faculty of Iran Medical University.

Hsu et al used the standard Numerical Anxiety Scale that included ten parts (15). In addition, this scale was first utilized by Imanipour and its reliability and validity were confirmed in Iran. The reliability coefficient of the tool was obtained by 85% (16). At the beginning of the study, demographic and illness forms were completed by the participants and the medical case was completed with the help of the researcher. Then, rhythmic breathing was trained to the patient individually, face to face, orally, and practically in addition to the routing observation.

Training was done by closing the eyes, losing the body, breathing regularly and calmly (breath, exhalation, and relaxation) in a way that air comes in the nose and exhales from the mouth, as well as paying attention to the upper parts of the lung, belly movement, and shoulders all the time (14). This training was performed for 20 minutes, but it was continued until the patient received the confidence about learning and doing correctly, and finally, the participates were asked to repeat the methods for research observation. After training, the patient was asked to practice the method to achieve enough skill in this field.

The control group was only under routine observation. At the arrival to the dressing room, the numerical anxiety scale determined by A code, was completed by samples who were previously familiar with it. Then, the patients of the experimental group were asked to do the rhythmic breathing in the dressing room during the dress change. Five minutes after leaving the dressing room, they completed the numerical anxiety scale questionnaire that was determined by B code. These tools were completed by just marking the answers. This process was continued for 3 consecutive days. It is notable that the researcher was present and observed the patients in all steps of the study. After collecting data and putting them into SPSS software, data were analyzed by using descriptive statistics (i.e., frequency, percentage of frequency, mean, and standard deviation), Z score, dependent and independent t test,

along with Freidman, Wilcoxson, and Mann-Whitney tests .It should be noted that to follow the ethical points, all members of the control group were trained rhythmic breathing.

Results

The study results by using Z score in addition to Wilcoxson and Mann-Whitney tests indicated that the parts under the study had significant differences in both groups in terms of age ($P = 0.492$), gender ($P = 0.436$), educational level ($P = 0.585$), marital status ($P = 0.249$), job condition ($P = 0.696$), economic situation (0.947), burning degree ($P = 0.154$), as well as the cause of burning ($P = 0.322$), painkiller consumption (0.739), and a field disease ($P = 1$). In other words, there was a correlation between the two groups in terms of the above-mentioned characteristics. Thus, considering the correlation of both groups in demographic variables, it can be perceived that the results were confidently based on the interventions. Based on the results of "comparing the anxiety from dress changing and after the intervention in both experimental and control groups on the first day", anxiety score was 6.01 ± 1.92 and 5.88 ± 2.10 in control and experimental groups before the intervention, respectively. According to the Mann-Whitney test findings, the average anxiety score was not statistically different between the two groups ($P = 0.727$). The anxiety score was 4.30 ± 1.83 after the intervention day and 3.14 ± 1.87 in the experimental group. In addition, the results of the Mann-Whitney test revealed that the average anxiety score significantly differed in the control group before and after the intervention. Further, the difference was significant in the experimental group and the average anxiety score reduced after the intervention ($P < 0.001$).

Furthermore, Wilcoxon test results showed a statistically significant difference and reduction in the anxiety score in the control group (Table 1). Moreover, the results represented that the difference was significant in the experimental group and the average anxiety score reduced more after the intervention of the first day. Regarding comparing the anxiety from dress

Table 1. Numerical Indices of Anxiety in Studied Patients in Experimental and Control Groups and the Comparison of the Averages in the First Day in 2017

Severity of Anxiety	Group			
	Control		Experimental	
	Mean	Standard Deviation	Mean	Standard Deviation
Before intervention	6.01	1.92	5.88	2.10
After intervention	4.30	1.83	3.14	1.87
Wilcoxon test	$P < 0.001$		$P < 0.001$	

Table 2. Numerical Indices of Anxiety in Studied Patients in Experimental and Control Groups and the Comparison of the Averages in the Second Day in 2017

Severity of Anxiety	Group			
	Control		Experimental	
	Mean	Standard Deviation	Mean	Standard Deviation
Before intervention	5.76	1.96	5.48	2.24
After intervention	3.93	1.71	2.70	1.60
Wilcoxon test	$P < 0.001$		$P < 0.001$	

changing in people suffering from burning in control and experimental groups, before and after the second day, the results indicated that the anxiety score was 1.96 ± 5.76 and 5.48 ± 2.24 in control and experimental groups before the intervention, respectively. Based on the results of the Mann-Whitney test, there was a significant difference between the two groups ($P = 0.635$) and the anxiety score was 3.93 ± 1.83 and 2.70 ± 1.60 in control and experimental groups on the second day, respectively. Additionally, Mann-Whitney test results showed that the average anxiety score significantly differed in control and experimental groups after the intervention in the second day ($P = 0.004$) so that the average anxiety score was lower in the experimental group. Based on the results of the Wilcoxon test in Table 2, the average of the anxiety score showed a significant reduction before and after the intervention in the second day. The difference was also significant on the experimental group and the average of the anxiety score further reduced after the intervention on the second day. The comparison of the anxiety from dress changing in people suffering from burning in control and experimental groups before and after the third day revealed that the anxiety score was 5.87 ± 2.03 and 5.16 ± 32.39 in control and experimental groups before the intervention. Mann-Whitney results indicated a significant difference between the two groups as well ($P = 0.245$).

In addition, the anxiety score was 3.99 ± 1.77 and 1.57 ± 2.31 in control and experimental groups on the third day. The results showed that the average of the anxiety score significantly varied in control and experimental groups after the intervention was on the third day ($P = 0.001$) so that it was lower in the experimental group.

According to Wilcoxon test results, the average of the anxiety score represented a significant difference and decreased before and after the intervention in the third day (Table 3). Further, the difference was significant in the experimental group and the average of the anxiety score reduced after the intervention on the third day. The results of Friedman's test (Table 4) showed significant differences between the two groups in the first, second, and third days in terms of anxiety changing ($P > 0.001$). The severity of anxiety decreased in both groups, but it was more in the experimental group. The results also revealed that anxiety changes in the control group were not statistically different in three days ($P = 0.208$) while the changes were significant in the experimental group during the three days ($P > 0.001$).

Discussion

The results of the study are in line with the findings of other studies. A meta-analysis systematic study investigated the effect of muscular relaxation, training jaw relaxation, rhythmic breathing, and relaxation exercises on anxiety from 1997 to 2007. Twenty-seven qualified studies were reviewed in this research. The results indicated that relaxation methods had a significant effect on anxiety reduction. Thus, due to the restrictions in the present study, more studies are required to investigate the effectiveness of relaxation methods (17).

Park et al (14) evaluated the effects of breathing relaxation on the pain and anxiety as observing burning patient and found that the non-drug intervention of relaxation was significantly different between the two groups and the anxiety reduced more in the experimental group, which conforms with the results of the recent study.

Table 3. Frequency Distribution of Anxiety Severity in Studied Patients in Experimental and Control Groups and the Comparison of the Averages in the Third Day in 2017

	Group			
Severity of Anxiety	**Control**		**Experimental**	
	Mean	**Standard Deviation**	**Mean**	**Standard Deviation**
Before intervention	5.87	2.03	5.16	2.39
After intervention	3.99	1.77	2.31	1.57
Wilcoxon test	$P < 0.001$		$P < 0.001$	

Table 4. Numerical Index of Patients' Anxiety Changes in Experimental and Control Groups and the Comparison of the Averages in 2017

	Group				**Mann-Whitney Test Results**
Anxiety Changes	**Control**		**Experimental**		
	Mean	**Standard Deviation**	**Mean**	**Standard Deviation**	
First day	4.30	1.30	3.14	1.87	$P < 0.001$
Second day	3.93	1.71	2.70	1.60	$P = 0.001$
Third day	3.93	1.77	2.31	1.57	$P = 0.001$
Friedman test	$P = 0.208$		$P < 0.001$		

In another study, Hsu et al (15) showed that the severity of anxiety was different in the parts under investigation before and after the non-drug intervention. In other words, this type of intervention reduced anxiety significantly, which corroborates with the findings of the present study. In addition, Mohaddes Ardabili et al (18) reported that massage can reduce the anxiety of the burning patient. Similarly, Najafi Ghezeljeh et al evaluated the effect of music on the anxiety and pain in the burning patients and reported that the intervention was effective on anxiety reduction (19). Lalegani et al (20), in a study focusing on the effect of deep and regular breathing on the patient with a burn, showed that intervention was effective on pain reduction. The results of Avazeh et al (21) indicated that to say the word "Allah" was effective on the pain and anxiety reduction in the burning patients. In another study, Busch et al (22) investigated the effect of slow and deep breathing on the pain and negative sense and found that breathing reduces the pain and negative senses. Considering the above-mentioned discussions, planning breathing has an effect on anxiety reduction.

To answer the hypothesis regarding the effect of rhythmic breathing on the anxiety caused by dress changing in burning patients, comparison of the two groups showed that the average score of anxiety in the experimental group was significantly different from the control group after the intervention, representing a great reduction in the experimental group. According to the results, rhythmic breathing caused a reduction in anxiety caused by dress changing in people who suffer from burning, thus confirming the research hypotheses. The limitations of the study could be attributed to the mental and psychological situation of the patients that could affect the rhythmic breathing when changing the dress of burning. In addition, it was effective when marking the numerical anxiety scale while talking to the samples before dressing and emphasizing the importance of cooperation and accuracy in the results of the study. The other limitation was that if the environment of the dressing room and the behavior of nurses could increase the anxiety in patients. Therefore, the nurses were reminded of the importance of behavior when changing the dress. Further, the pain killer given to the patients before dressing could affect the results because it was uncontrollable. However, the drug and its level were the same. Furthermore, intervention factors such as the noise of the workers and coworkers was another limitation that could interfere with the results of the study. To solve this issue, the coordination was done with workers so that to decrease the intervention effects. Furthermore, the samples of the research were included using the inclusion criteria, therefore, generalizing the results to other populations is impossible. Based on the results and intervention effectiveness in this population, it is necessary to further study other similar groups to generalize the results. Undoubtedly, the most important motivation of the research is to apply the results and since

nurses are the members of the treatment group, they are directly responsible for taking care of these clients, relieve the pains, reduce the anxiety, and create relaxation. The findings of the present study can be applied in the training and observations of the patients and family. Moreover, the findings of the study can be a field for more investigation.

Additionally, the results of the study can provide training in clinical nursing management to the students and can be a motivation for more research in this field. It is a clinical observation in the training system of the students as well. Finally, using non-drug methods for reducing anxiety in burning patients should receive more attention.

Authors' Contribution
Mohannad Reza Zarei, Leila Mamashli, Collected the data.
Fatemeh Mohaddes Ardebili developed the study design and edited the article.
Mehri Bozorgnejad analyzed the data.
Mehri Bozorgnejad, Mohammad Reza Zarei ,Leila Mamashli, Fatemeh Mohaddes Ardebili interpreted the results and prepared the manuscript.
All authors read and approved the final version of the manuscript.

Informed Consent
Before the data collection, the purpose of the study was explained to the participants, and informed consent was obtained verbally from them.

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